

Please cancel claim 18 without prejudice.

Please amend claims 19-24 as shown in the enclosed marked-up copy of amended claims 19-24.

Please cancel claims 25-29 without prejudice.

Please add new claims 30-42 as shown in the enclosed clean copy of claims 30-42.

Remarks:

11/2/15
Support for new claims 32 and 36 can be found in the application on pages 18-19 wherein it is disclosed that a plurality of parallel matching processors and memory devices can be used to speed up the process of matching sensed fingerprint data with stored fingerprint data.

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Support for new claims 33 and 37 can be found in the application on pages 20-21 wherein the rejection of sensed fingerprint data that perfectly matches stored fingerprint data is disclosed. Such perfect matches may indicate a forgery. *fingerprint code*

11/2/15
Support for new claims 34 and 38 can be found in the application on pages 26-27 wherein the recording of the sensed fingerprint data of an unauthorized person corresponding to a failed access attempt is disclosed. *fingerprint code*

Support for new claims 35 and 39 can be found in the application on pages 24-26 wherein it is disclosed how the invention can be used to limit access for authorized person to certain times.

11/2/15
Support for new claim 41 can be found in the application on pages 68-69 and Figure 46 wherein it is disclosed how the invention can be used to both lock/unlock a first object and connect/disconnect power to a second object as a result of a positive fingerprint match determination.

Support for the limitation in independent claims 11, 19, and 40 that the fingerprint pattern comprise "at least a portion of a plurality of ridges and a plurality of valleys of a finger in both an x-direction and a y-direction of a finger when said finger is pressed against said sensor" can be found in the application on page 12.

... Here, the signal from each detection element differs depending on the pressure applied by the finger on the sensor 100, i.e., depending on whether it was pressed by a ridge or whether there was no ridge (valley) at that location in the finger. Therefore, by expanding the signal from the detection elements on to an x-y plane

CLEAN COPY OF AMENDED CLAIMS 11-29 AND NEW CLAIMS 30-42

11. (amended) A locking device comprising:
- (a) a locking mechanism for locking and unlocking movement of an object;
 - (b) a pressure-based fingerprint sensor for detecting a fingerprint pattern comprising at least a portion of a plurality of ridges and a plurality of valleys of a finger in both an x-direction and a y-direction when said finger is pressed against said sensor;
 - (c) a semiconductor memory device for storing registered fingerprint data;
 - (d) a processor configured to determine by electronic processing whether the fingerprint data created from the fingerprint pattern detected by said fingerprint sensor matches with any of the registered fingerprint data stored in said semiconductor memory device; and
 - (e) a control unit for controlling whether said locking mechanism locks or unlocks movement of said object in response to said fingerprint match determination by said processor.
12. (amended) The locking device of claim 11 further comprising a portable key unit separated from said locking mechanism for communicating to said control unit how to control said locking mechanism according to said fingerprint match determination by said processor, said portable key unit comprising said sensor, said processor, and said semiconductor memory device but not said control unit.
13. (amended) The locking device of claim 12 wherein said portable key unit is configured to communicate with said control unit via (1) at least one electrical connector, (2) wireless communication, (3) magnetic coupling, or (4) electrostatic coupling.
14. (amended) The locking device of claim 12 wherein said portable key unit is a card.
15. (amended) The locking device of claim 11 further comprising a portable key unit separated from said locking mechanism, said portable key unit comprising said processor but not any of said components (b), (c), or (e).

16. (amended) The locking device of claim 11, wherein said processor is a first processor, wherein said locking device further comprises a second processor in communication with said first processor and said semiconductor memory device, said second processor being configured to register an authorized person by storing in said semiconductor memory device fingerprint data created from said fingerprint pattern of said authorized person and detected by said sensor, and wherein said locking device further comprises a portable key unit separated from said locking mechanism, said portable key unit comprising either (i) said first processor and said sensor but not said second processor, or (ii) said second processor and said sensor but not said first processor.

17. (amended) The locking device of claim 11 further comprising a portable key unit separated from said locking mechanism, said portable key unit comprising said sensor and said processor but not any of said components (c) or (e).

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19. (amended) A switching device comprising:
(a) a starting switch for starting operation of an object;
(b) a pressure-based fingerprint sensor for detecting a fingerprint pattern comprising at least a portion of a plurality of ridges and a plurality of valleys of a finger in both an x-direction and a y-direction when said finger is pressed against said sensor;
(c) a semiconductor memory device for storing registered fingerprint data; and
(d) a processor configured to (1) determine by electronic processing whether the fingerprint data created from the fingerprint pattern detected by said sensor matched with any of the registered fingerprint data stored in said semiconductor memory device and (2) actuate said starting switch in response to said fingerprint match determination being positive.

20. (amended) The switching device of claim 19 further comprising a portable key unit separated from said starting switch, said portable key unit comprising said semiconductor memory device but not said sensor or said processor.
21. (amended) The switching device of claim 19 further comprising a portable key unit separated from said starting switch, said portable key unit comprising said sensor and said processor but not said semiconductor memory device.
22. (amended) The switching device of claim 19 wherein said processor is a first processor, wherein said switching device further comprises a second processor in communication with said first processor and said semiconductor memory device, said second processor being configured to register an authorized person by storing in said semiconductor memory device fingerprint data created from said fingerprint pattern of said authorized person and detected by said sensor, and wherein said switching device further comprises a portable key unit separated from said starting switch, said portable key unit comprising either (i) said first processor and said sensor but not said second processor, or (ii) said second processor and said sensor but not said first processor.
23. (amended) The switching device of claim 31 wherein said portable key unit is configured to communicate with said starting switch via (1) at least one electrical connector, (2) wireless communication, (3) magnetic coupling, or (4) electrostatic coupling.
24. (amended) ~~The switching device of claim 31 wherein said portable key unit is a card.~~

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30. (new) The switching device of claim 19 further comprising a portable key unit separated from said starting switch, said portable key unit comprising said sensor or said semiconductor memory device.

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31. (new) The switching device of claim 19 further comprising a portable key unit separated from said starting switch for communicating to said starting switch whether said starting switch is to be actuated according to said fingerprint match determination by said processor, said portable key unit comprising said sensor, said semiconductor memory device, and said processor.

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32. (new) The locking device of claim 11 further comprising a plurality of said processors and a plurality of said semiconductor memory devices, said plurality of processors and said plurality of semiconductor memory devices being configured to perform said fingerprint match determinations in parallel.

33. (new) The locking device of claim 11 wherein said processor is further configured to make a negative fingerprint match determination if said sensed fingerprint data perfectly matches any of said registered fingerprint data.

34. (new) The locking device of claim 11 wherein said processor is further configured to store said sensed fingerprint pattern in said semiconductor memory device in response to said fingerprint match determination being negative.

35. (new) The locking device of claim 11 further comprising a clock unit for generating a periodic clock signal and a time determining unit configured to maintain a time value according to said clock signal and identify a time value when a finger is pressed against said sensor, wherein said semiconductor memory device is further configured to store access control data, said access control data identifying when an authorized person for whom registered fingerprint

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data is stored is allowed to lock or unlock movement of said object, and wherein said processor is further configured such that said locking or unlocking of said object is further dependent upon said processor positively determining from a comparison between said access control data and said identified time value that said authorized person is allowed to lock or unlock movement of said object.

4357 36. (new) The switching device of claim 19 further comprising a plurality of said processors and a plurality of said semiconductor memory devices, said plurality of processors and said plurality of semiconductor memory devices being configured to perform said fingerprint match determinations in parallel.

37. (new) The switching device of claim 19 wherein said processor is further configured to make a negative fingerprint match determination if said sensed fingerprint data perfectly matches any of said registered fingerprint data.

38. (new) The switching device of claim 19 wherein said processor is further configured to store said sensed fingerprint pattern in said semiconductor memory device in response to said fingerprint match determination being negative.

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El 39. (new) The switching device of claim 19 further comprising a clock unit for generating a periodic clock signal and a time determining unit configured to maintain a time value according to said clock signal and identify a time value when a finger is pressed against said sensor, wherein said semiconductor memory device is further configured to store access control data, said access control data identifying when an authorized person for whom registered fingerprint data is stored is allowed start operation of said object, and wherein said processor is further configured such that said starting operation of said object is further dependent upon said processor positively determining from a comparison between said access control data and said identified time value that said authorized person is allowed to start operation of said object.

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Spice 40. (new) A lock-controlling system comprising:
(a) a locking mechanism for locking and unlocking movement of an object;

- (b) a control circuit for controlling whether said locking mechanism locks or unlocks movement of said object;
- (c) a semiconductor memory device for storing registered fingerprint data;
- (d) a pressure-based fingerprint sensor for detecting a fingerprint pattern comprising at least a portion of a plurality of ridges and a plurality of valleys of a finger in both an x-direction and a y-direction when said finger is pressed against said sensor; and
- (e) ² a processor configured to (1) create sensed fingerprint data from said fingerprint pattern detected by said sensor, (2) determine whether a fingerprint match exists by comparing said sensed fingerprint data with said registered fingerprint data, and (3) actuate said control circuit in response to said fingerprint match determination being positive, said processor being in communication with said semiconductor memory device, said sensor, and said control circuit.

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41. (new) The lock-controlling system of claim 40 wherein said object is a first object, wherein said system further comprises a starting switch in circuit with a second object, said starting switch being operable to connect or disconnect power to said second object, and wherein said processor is in communication with said starting switch and is further configured to operate said starting switch in response to said fingerprint match determination being positive.

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42. (new) The locking device of claim 11 further comprising a portable key unit separated from said locking mechanism, said portable key unit comprising said semiconductor memory device, and wherein said processor is further configured to compare the fingerprint data created from the fingerprint pattern detected by said fingerprint sensor with the registered fingerprint data stored in said semiconductor memory device when unlocking is needed.